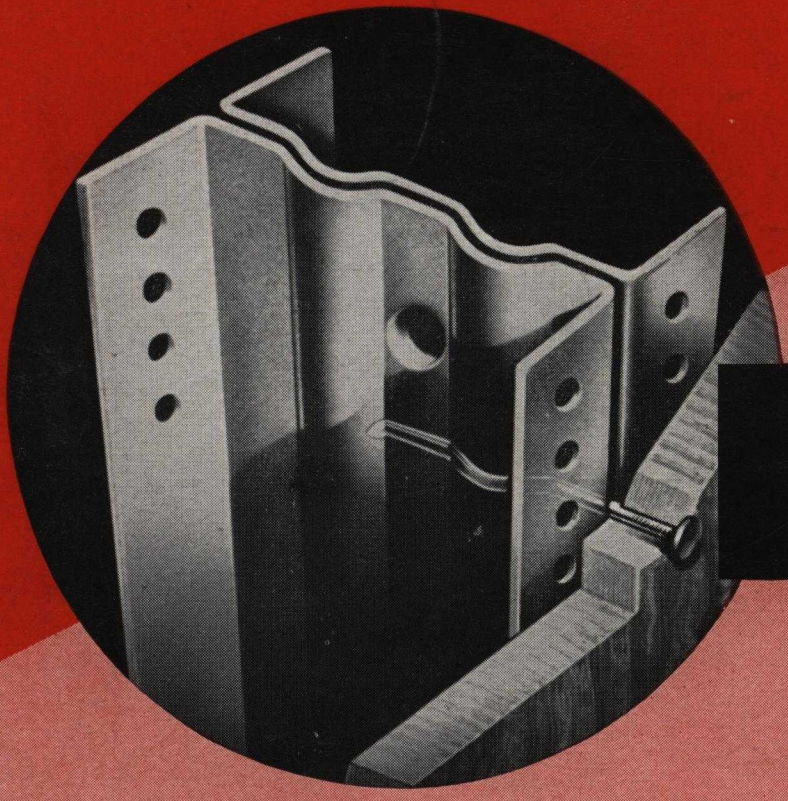
STRAN-STEEL



YOU NAIL TO STRAN-STEEL FRAMING

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LADUE SUPPLY, INC.
8870 Ladue Rd. Clayton 5, Mo.
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UNIT OF NATIONAL STEEL

GREAT LAKES STEEL CORPORATION
STRAN-STEEL DIVISION
Penobscot Building, Detroit 26, Michigan

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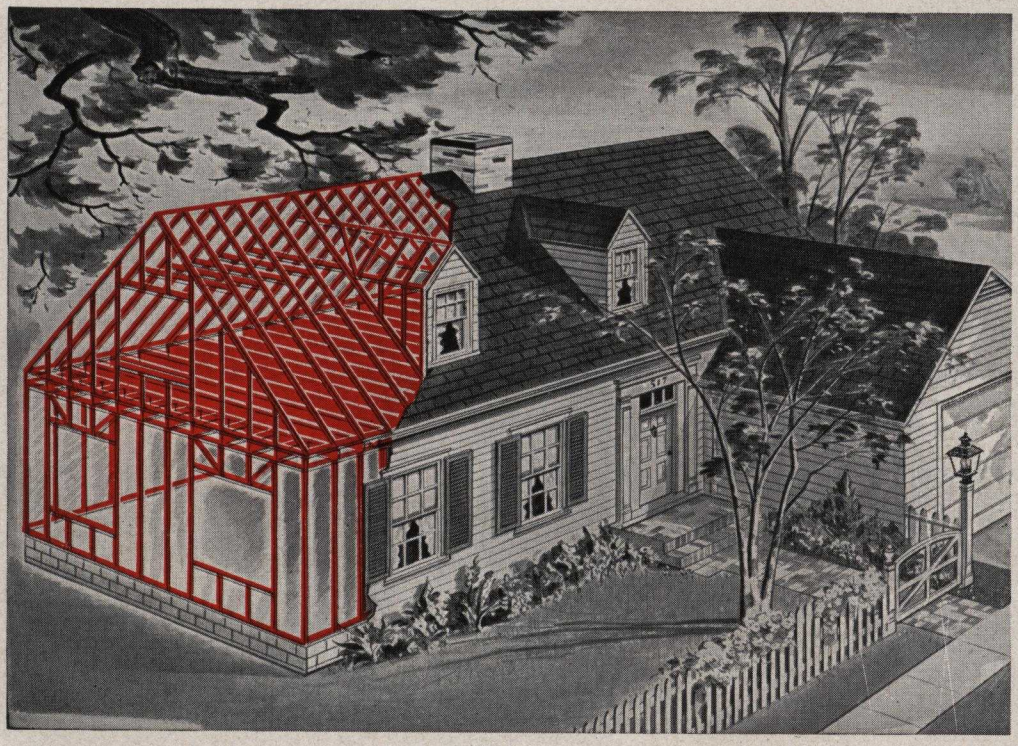
STRAN-STEEL

A SYSTEM OF LIGHT STEEL FRAMING FOR HOMES, APARTMENTS, COMMERCIAL BUILDINGS AND OTHER TYPES OF LIGHT OCCUPANCY STRUCTURES



FOR ENDURING BEAUTY AND LASTING SATISFACTION BUILD WITH STRAN-STEEL

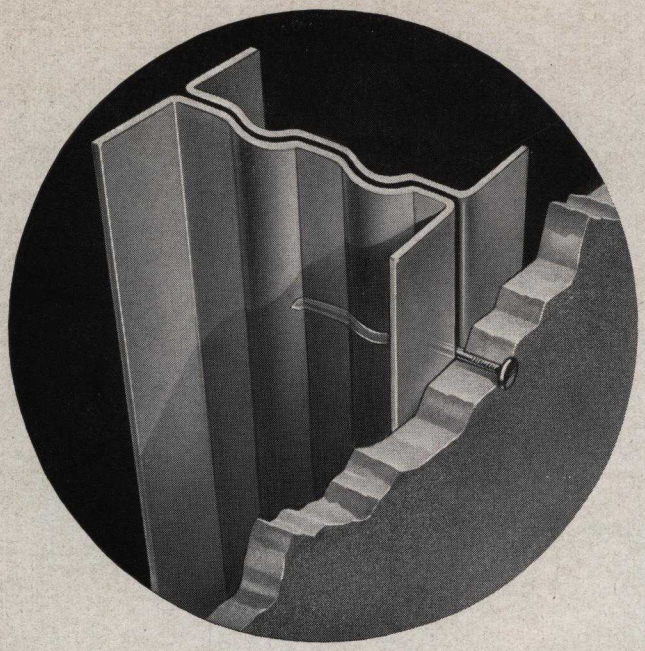
★ ★ ★

GREAT LAKES STEEL CORPORATION

STRAN-STEEL DIVISION • 37th FLOOR PENOBSCOT BLDG.
DETROIT 26, MICHIGAN

UNIT OF NATIONAL STEEL CORPORATION

Stran-Steel–What It Is



THE DISTINCTIVE NAILING GROOVE

Distinctive feature of Stran-Steel is the "nailing groove"—an exclusive Stran-Steel patent. Because of it, fire-safe, economical and permanent steel construction can now be applied to dwelling units and other types of light-occupancy structures. The nailing groove is found in all Stran-Steel joists and studs, which are made by welding two pieces of specially formed steel together. In the case of the stud, for example, two channel sections, specially formed, are welded back to back, as shown in the accompanying illustration. The small space remaining between these pieces is just large enough to admit an ordinary nail. Driven in this groove, the nail is curved to the profile of the specially formed channels, and clinched in a grip of steel, utilizing to the utmost a holding power that cannot be duplicated with any other type of building material.

In this manner collateral materials are attached directly to the steel framework by the ordinary hammer-and-nails method!

FORMED OF STRIP STEEL

Strip steel — from which all Stran-Steel members are formed — is produced in strip mills in the form of continuous coils, several thousand feet in length. Any specified thickness or gauge, ranging from 1/32″ (23 U. S. Std. Ga.) to 3/16″ (7 U. S. Std. Ga.) can be produced merely by adjusting the rolls to suit the desired thickness.

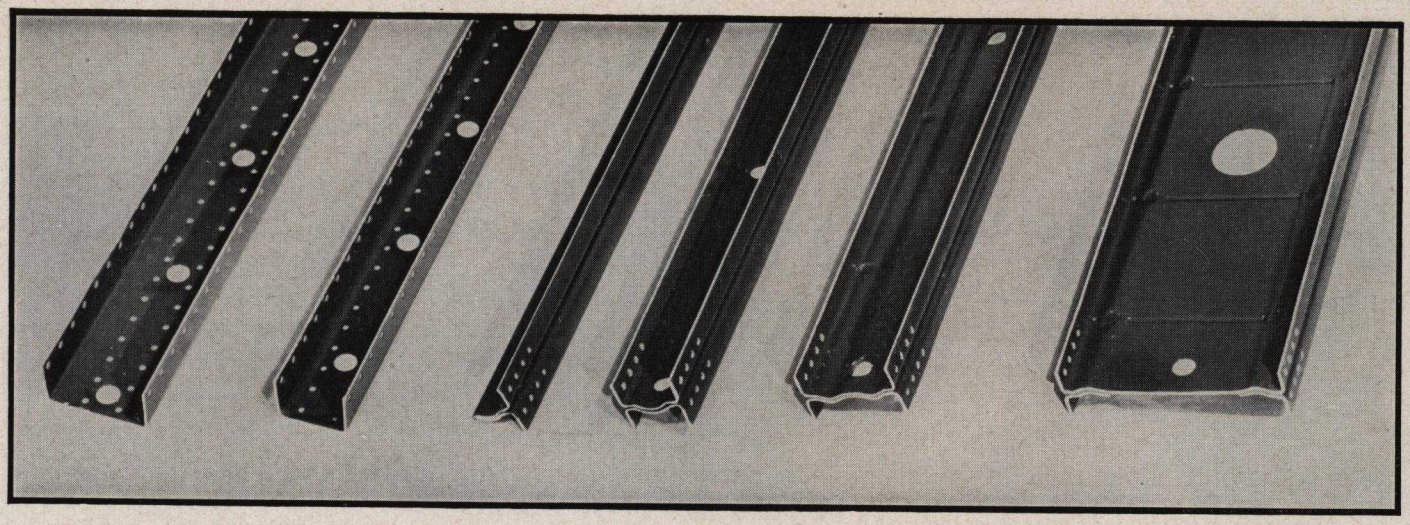
With such a wide variety of thicknesses or gauges from which to choose, it is a simple matter for the architect or engineer to hold the weight of members to a minimum consistent with load requirements. This saving in steel results in savings to the builder!

VERSATILITY

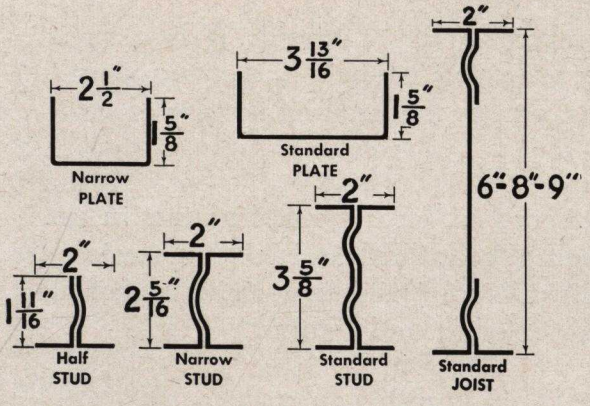
Any light-occupancy building up to and including three stories in height can be economically framed in Stran-Steel—floors, roof, bearing and non-bearing walls and partitions.

As illustrated hereinafter, Stran-Steel has been successfully used in residences, multiple dwellings, commercial and industrial buildings, over a period of 16 years, and in thousands of complete buildings which served America at war. Among the latter are the famous Stran-Steel-framed arch-rib "Quonset" buildings in 20′ and 40′ widths, hangars, parachute lofts and two-story arch-rib barracks buildings.

Stran-Steel Framing Members



DIMENSIONS OF TYPICAL MAIN MEMBERS



TYPICAL JOIST—Joists are manufactured in three depths—6", 8" and 9"—and in three gauges—16, 14 and 12. This member is used for floor joists and roof rafters.

STANDARD STUD—3⅝" in depth with 2" flange. This member is used for framing both interior and exterior bearing walls up to three stories in height. Recommended spacing of Stran-Steel studding is 24" o.c. This member is also used for ceiling joists and roof rafters where span conditions are such as not to require deeper sections.

NARROW STUD—2-5/16" in depth with 2" flange. This member is used for framing exterior walls up to two stories in height and interior bearing and non-bearing partitions. It is also used for ceiling joists having light loads. This member is adaptable as furring around ducts, pipe chases, etc., where nailing of collateral materials is required.

HALF STUD—1-11/16" deep with 2" flange. It is used as an auxiliary nailing piece to provide for nailing of collaterals where no great structural strength is required.

STANDARD PLATE — 3-13/16" wide with 1⅝" flanges. This member is used with the 3⅝" stud section as a top and bottom plate and as a sill or head member for window and door openings where nailing section is not required. Holes in flanges punched at 1" intervals for stud connections. Punching in web of channel for anchor bolts at 6" intervals.

NARROW PLATE — 2½" wide and 1⅝" flanges. This member, used with the narrow stud, is similar to the standard channel plate with similar punching.

STANDARD PUNCHING FOR PIPE, WIRING CONDUITS, ETC. — All Stran-Steel main members except the half stud section are factory-punched in the webs. Holes are provided in the studding for the passage of conduits, pipe, etc. Joists and studs are punched on top and bottom flanges with eight holes 13/64" in diameter, for the placing of screws.

FINISH—All Stran-Steel members and attachments are painted with a heavy coat of special rust-resisting paint. The protective coating is tough and very adhesive—will not chip, and resists scratching in handling and erection.

STANDARD LENGTHS—To 30 feet, inclusive.

ACCESSORIES—All necessary accessories for the proper erection of Stran-Steel are included with each job: bridging, joist hangers, C-clips, header brackets, corner brackets, stud brackets, half-stud trimmer, combination clip, rafter plates, hip and valley collars, rafter clips, rafter hinges, collar-tie brackets, self-threading screws and bolts. All Stran-Steel parts and attachments are designed to develop full strength of connections.

Advantages of Stran-Steel

UNIFORM IN QUALITY—Complete control of all manufacturing operations from raw material to finished product insures uniformity in quality.

STRENGTH—Stran-Steel framing members and accessories all have definite engineered strength characteristics. Carrying capacities and strength factors can easily be determined. See pages 14 and 15.

ECONOMY—The Stran-Steel framing system has demonstrated its economy in hundreds of thousands of buildings the world over. Its great strength-to-weight ratio results in the most economical use of steel.

NO SPECIAL PLANNING REQUIRED—The use of Stran-Steel in no way affects the planning of a building. Stran-Steel engineers are available on request to examine contemplated projects, and are prepared at all times to recommend the type of design which will affect the greatest economy in materials and construction.

FIRE PROTECTION—Stran-Steel in itself is an incombustible material. When used in combination with non-inflammable covering or facing materials, a fire-resistant type of construction results, at a lower cost than can be realized by the use of combustible materials.

STANDARD COLLATERAL MATERIALS USED—The use of Stran-Steel framing in no way limits the architect or builder in the selection of collateral and finish materials. The patented nailing groove feature of all Stran-Steel joists and studs makes it possible to apply any type of finish on both the exterior and interior.

SHRINKAGE ELIMINATED—Stran-Steel, because of its inability to absorb moisture, cannot warp, twist or otherwise change its shape. Therefore, plaster cracks and other objectionable features, so commonly encountered in wood construction, are entirely lacking.

FUNGI- AND TERMITE-PROOF—The yearly damage to homes and other buildings by the spreading plague of termites amounts to many millions of dollars. Stran-Steel framing permanently resists damage by termites, rodents and fungi.

CARPENTERS ERECT—Carpenters familiar with wood framing are well qualified to erect Stran-Steel framing. No special tools are required.

DEMOLITION SALVAGE—Stran-Steel framing can be completely taken down without injury to the framing members, providing 100% salvage of materials.

Erection Methods

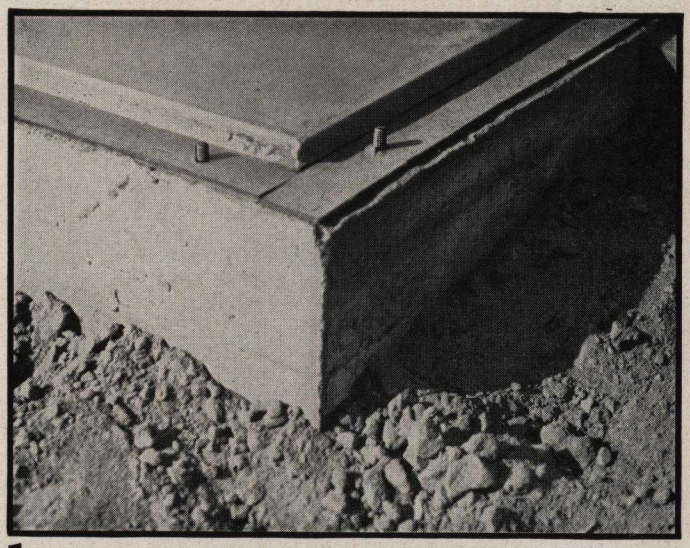
Stran-Steel framing is very simple to erect. The fact that all framing members are delivered to the job cut to exact lengths and completely fabricated, assures speedy erection. Illustrations on these pages show the normal erection methods.

1 In lower-cost basementless construction, provision is made when pouring the first floor slab and foundation walls for anchoring the Stran-Steel plate by means of anchor bolts placed in the concrete or masonry at required spacing, usually 4′ o.c. Standard 13/16″ holes are factory-punched in the plates to receive anchor bolts.

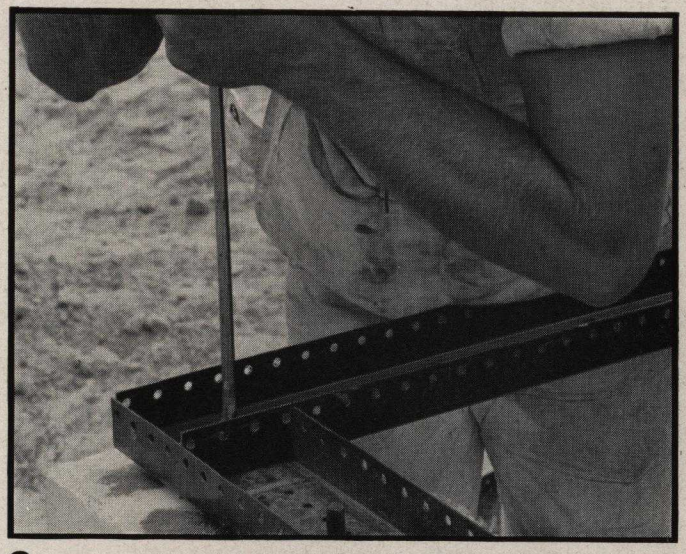
2 Where plates lap at the corners in basementless construction, or where Stran-Steel first floor joists are used, the plates are secured together with self-threading screws. See illustration 2.

3 When a basement is used, Stran-Steel joists are erected in the conventional manner, spaced normally 24 inches on centers. When the joists have been laid out over the basement area, a simple type of lock-bridging is quickly installed. This bridging not only stiffens the floor construction, but since it is precision-made, it maintains accurate joist spacing. Joists are bridged at intervals of not over 7 feet. See illustration 4.

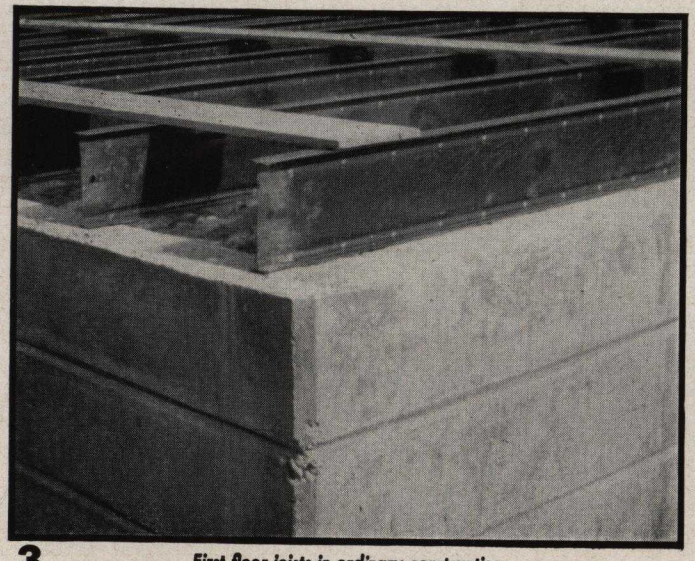
4 Where joists lap over a central beam or where joists are doubled to support bearing partitions or for headers and trimmers, C-clips are hammered into the nailing grooves, firmly anchoring them together. See illustration 4.



1 *Anchor bolts set in concrete sub-floor.*



2 *Self-threading screws hold channel plates at corner.*



3 *First floor joists in ordinary construction.*

4 *C-clips anchor joists together.*

Erection Methods

5 *Channel plates laid across first floor joists*

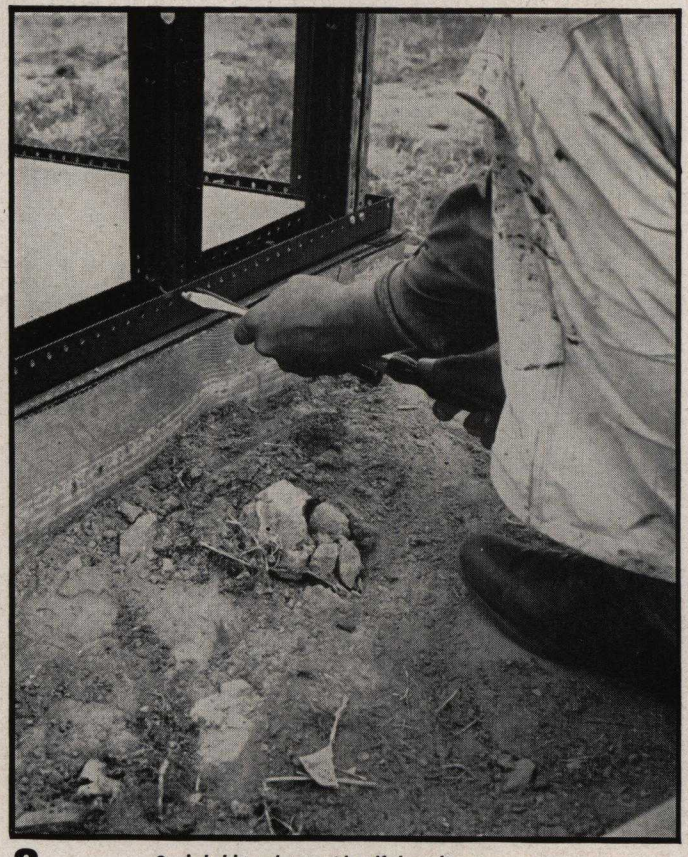
6 *Filling in space between joists.*

7 *Raising first floor wall to position.*

5 When the first floor joists have been erected and bridged, a standard Stran-Steel plate is laid over the tops and screwed securely to the joist to receive wall studs.

6 Where first floor joists are used on concrete walls, recommended practice is to fill in between joists with masonry on exterior and interior bearing walls. Care should be taken to see that joists are level before masonry work is applied. See illustration 6. At this point a corrugated iron or light steel deck sub-floor is laid nailed to the joists. This sub-floor acts as an excellent working deck while the rest of the frame is being erected. No time is lost waiting for the concrete sub-floor to dry, as this is usually poured after the exterior sheathing has been applied. Such a sub-floor provides fire-safety over the basement at a minimum cost.

7 The next operation is the erection of the studding. Usually the loose studs are laid on the sub-floor and the top plate fastened. This simplifies the stud spacing (normally 2 ft. o.c.), since both top and bottom plates may be marked for stud centering simultaneously. With the top plate fastened, the wall is raised, set into the bottom plate and secured with screws, as shown in illustration 8.



8 *Studs held to plates with self-threading screws.*

Erection Methods

8 Second floor joists are erected and secured to the first story bearing stud plates in a manner similar to the construction of the first story floor, and second story walls and partitions proceed as described for first story walls and partitions.

9 The roof framing may be effectively done in one of two ways. On buildings with long roofs, such as apartments, schools, hospitals, etc., or on projects with considerable duplications, welded roof trusses are the most economical. On single dwellings and on complicated roof framing, it is generally more practical to use standard rafters erected individually.

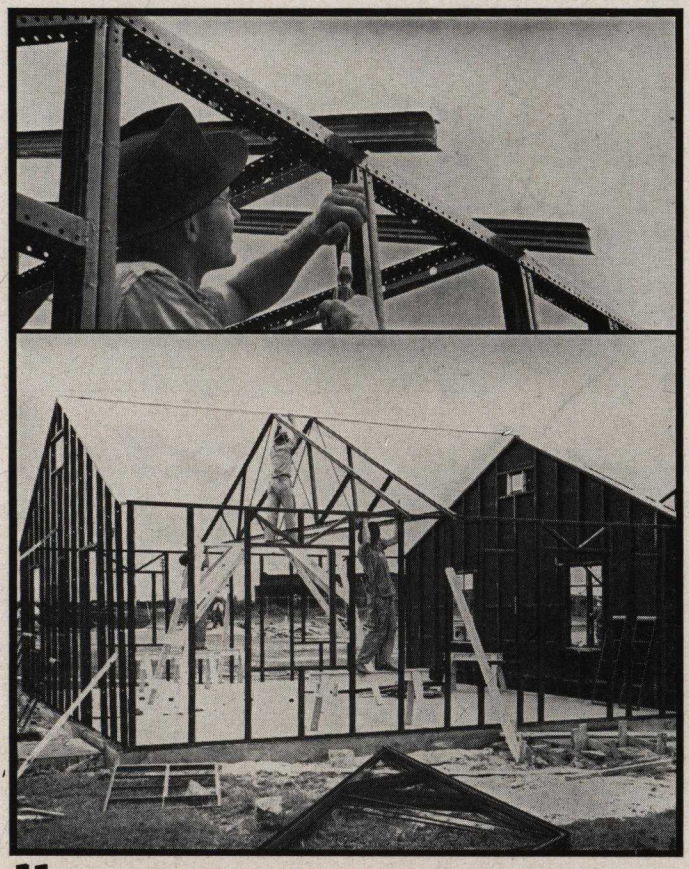
Trusses provide a clear span up to about 36 feet. Two men can erect them, since they weigh but from 60 to 90 pounds each (see illustration 11). Normally they are spaced like the joists and studs, 2 feet on centers.

Trusses are obtainable as units prefabricated before delivery, or they can be site-assembled and welded from pre-cut members on a simple jig table. Temporary bracing is used. Care should be taken that all steel work is level and plumb before applying collateral materials.

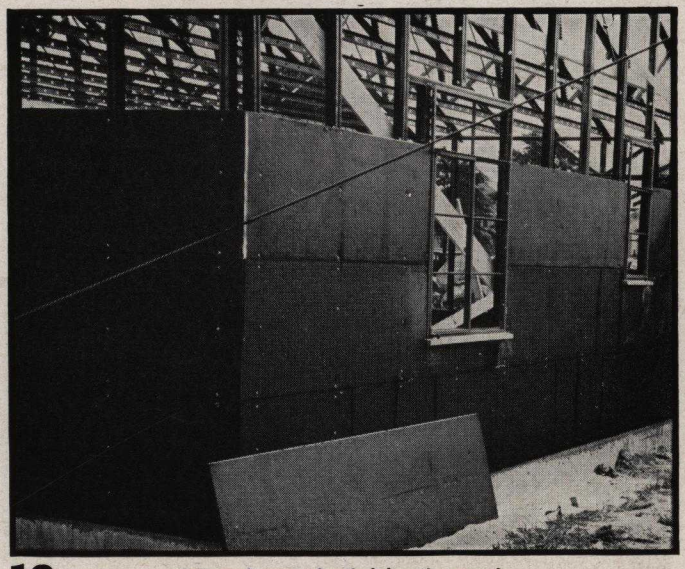
10 Collateral materials both inside and out are nailed directly to the Stran-Steel studding, joists and rafters. When fire-resistant collateral materials are selected, an economical, fireproof construction results. Any collateral material applicable to wood framing can be used with Stran-Steel framing—finishes for both outside and inside may be identical.

9 *Lock-bridging on second floor joists.*

10 *Applying zinc-chromate paint to welds for protection.*



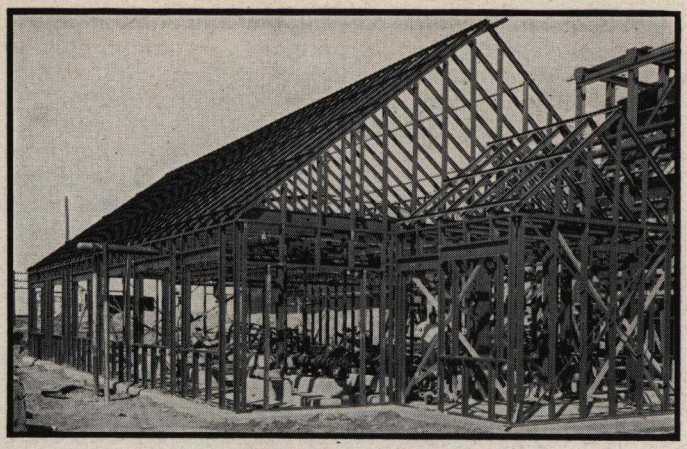
11 *Erection of welded trusses on small home project.*



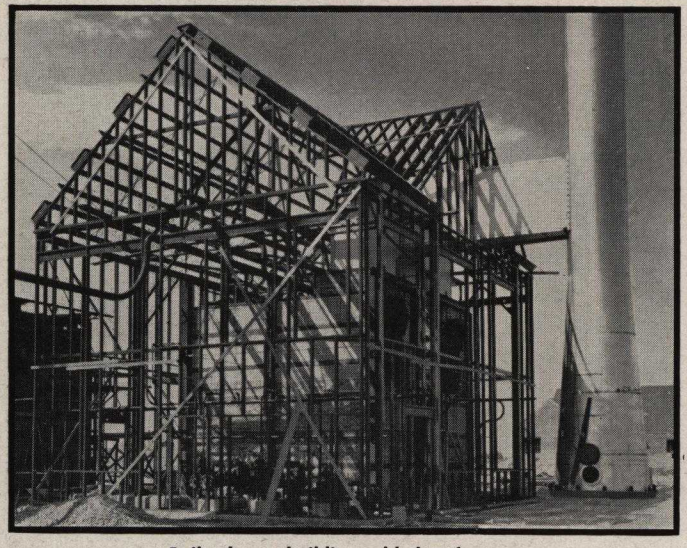
12 *Collateral material nailed directly to studs.*

Typical Examples

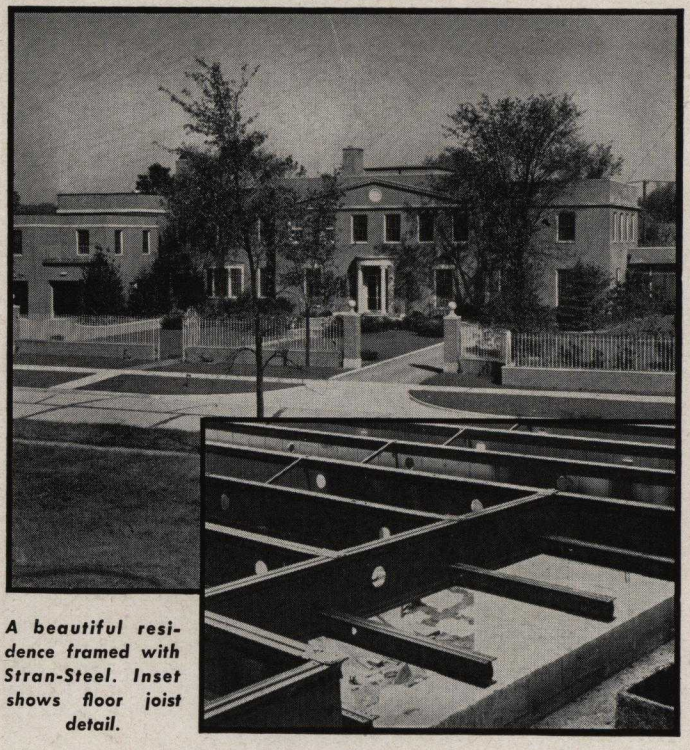
Warehouse building using Stran-Steel roof purlins.



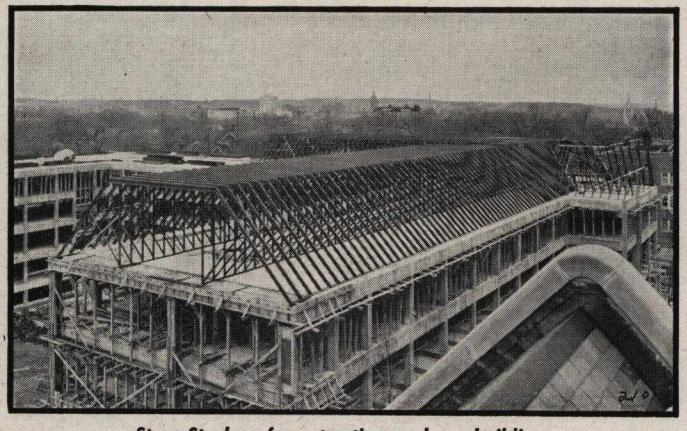
Pump house added to manufacturing plant.



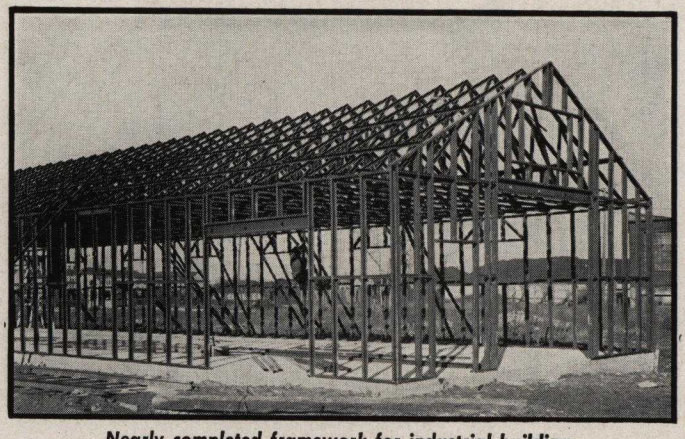
Boiler house building added to factory.



A beautiful residence framed with Stran-Steel. Inset shows floor joist detail.



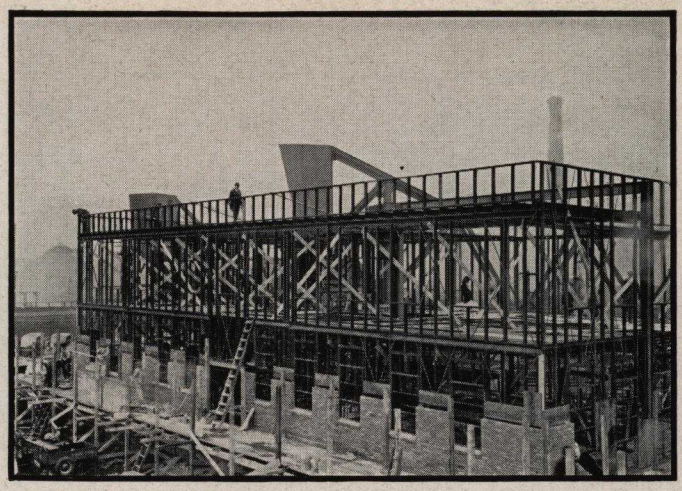
Stran-Steel roof construction on huge building.



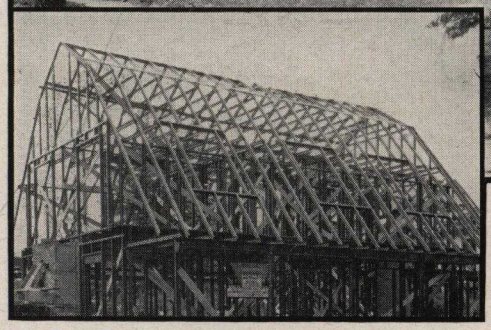
Nearly completed framework for industrial building.

Typical Examples

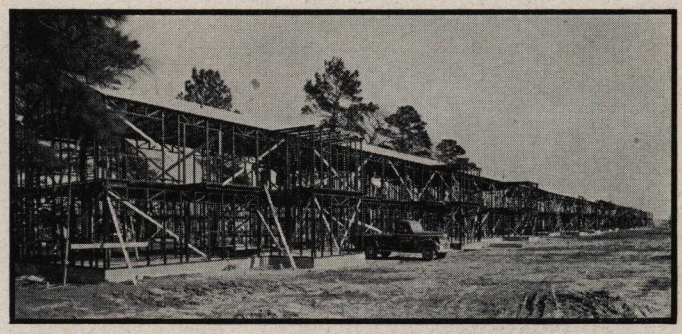
350-family apartment group—Arlington, Virginia.



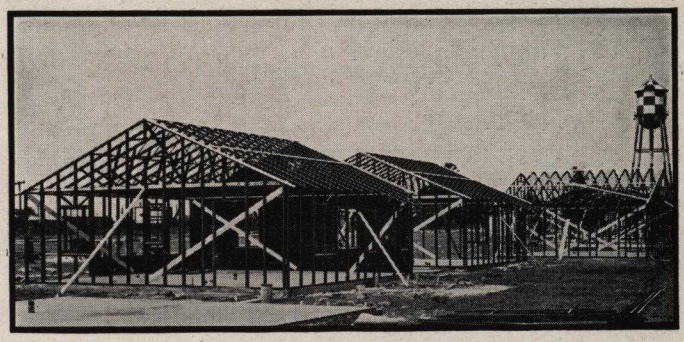
View of Stran-Steel in commercial building.



Above—part of the famous Ford Foundation, framed with Stran-Steel. Inset shows framing for single home.

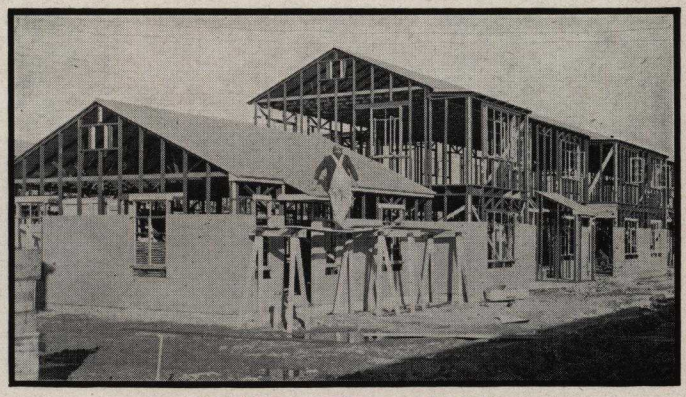


Stran-Steel framing in place on a multiple dwelling building.



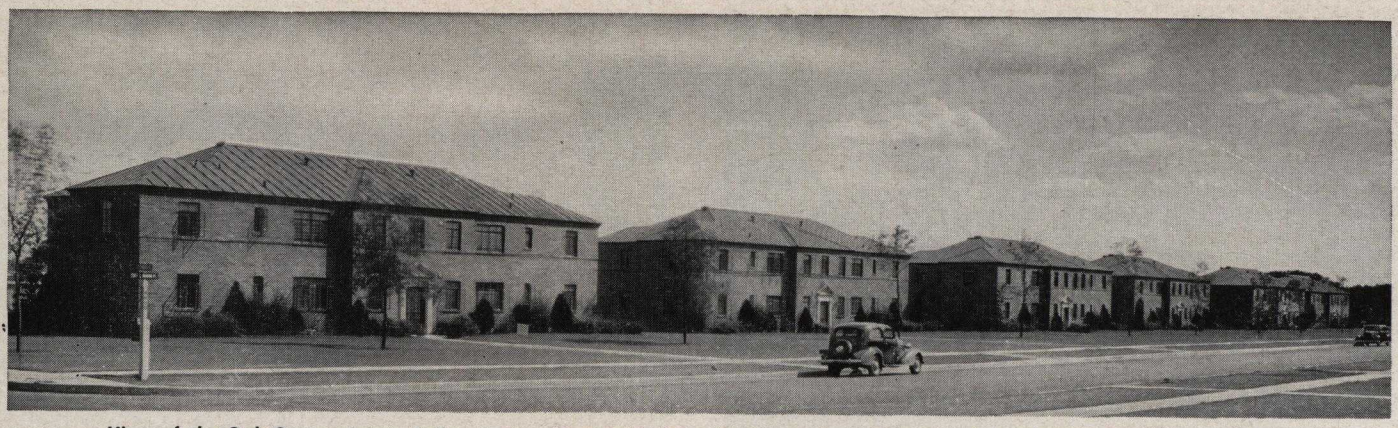
U. S. Navy homes in Norfolk.

Stran-Steel framed church.



U. S. Navy apartments at Norfolk.

Typical Examples

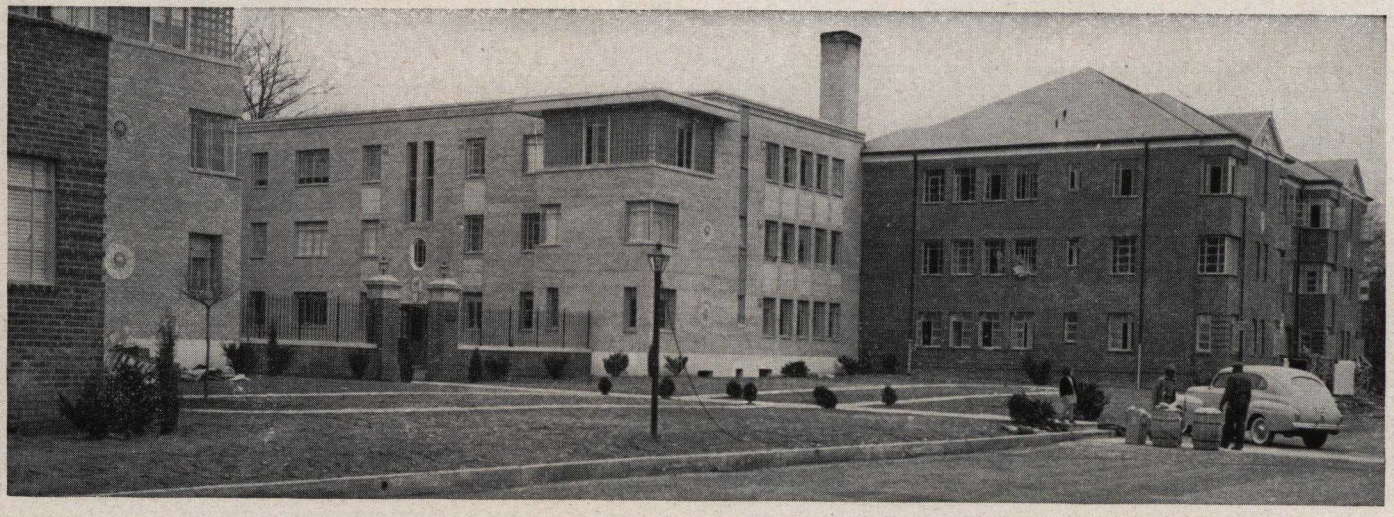


View of the Oak Grove project, Dallas, Texas. Outstanding rental projects such as this have benefited by the use of Stran-Steel.

Part of the River Oaks Garden multiple-dwelling project, Houston, Texas, framed with Stran-Steel.

See pages 14 to 21 inclusive for Engineering Data, Construction Details and Descriptions of Stran-Steel accessories.

Small commercial structure framed with Stran-Steel—an assurance of long life and low upkeep cost.



Large amounts of Stran-Steel have been used in the Washington, D. C., area—location of the apartment project shown above.

Specifications

WORK INCLUDED—Shall be the furnishing of Stran-Steel joists, studs, etc., as manufactured by the Great Lakes Steel Corporation, Stran-Steel Division, Penobscot Building, Detroit 26, Mich.

SHOP-PAINTING—All framing members shall be given a coat of special rust-resisting paint at the shop.

ERECTION OF FRAME—Shall be done by skilled mechanics in a substantial, workmanlike manner, true to line, level and plumb, in accordance with the manufacturer's specifications and recommendations.

JOISTS—Joists throughout shall be of sizes determined by live load and dead load requirements, or as recommended by the manufacturer. Double all joists or provide heavier gauge single joists of proper carrying capacity under partitions and around all floor openings for stairs, chimneys, etc. Double joists shall be fastened together with C-clips.

JOIST HANGERS—Stran-Steel joist hangers shall be provided for the support of headers and trimmers and for the support of all tail joists over 5′ 0″.

CROSS-BRIDGING—Provide standard self-locking channel-section bridging, one row for spans up to 7′0″, two rows for spans up to 14′0″, three rows for spans over 14′0″.

PARTITION SUPPORTS—Where partitions running parallel to the joists are not directly supported by a joist, half stud partition supports shall be provided spanning between two joists centered under and supporting each stud of the partition.

CHANNEL PLATES—Channel plates to fit studs shall be provided as sills and plates for all exterior wall studding, all interior partitions, and elsewhere where required. Channels shall be lapped and fastened with two (2) screws at all corners.

STUDDING—Studs shall be provided for all exterior walls and interior partitions, and shall be secured to sills and plates with four (4) screws each, two at top and two at bottom through diagonally opposite stud flanges. Provide jack studs between main wall sills and plates and window sills; between window and door lintels or headers and main wall plates above; for all gable walls; and wherever else required to provide nailing for enclosing exterior and interior wall material or finish. Provide studs to serve as jamb studs at all openings where main wall or partition stud spacing does not fulfill requirements.

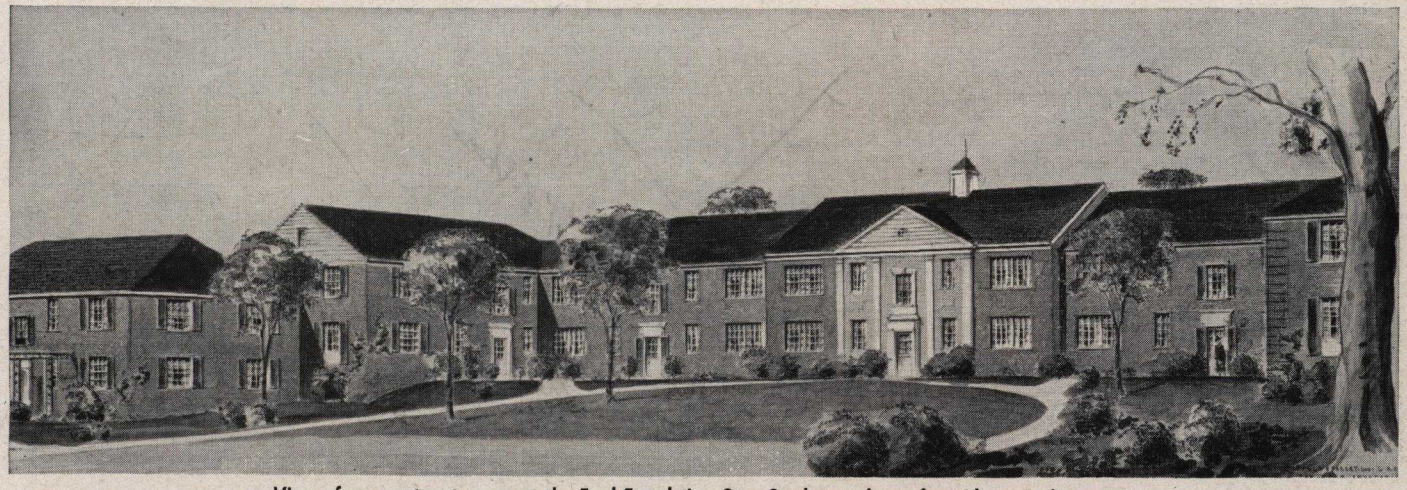
OPENING SILLS AND HEADERS—Sills and headers shall be provided as required for all exterior and interior wall and partition openings, and headers shall be secured by header brackets.

PARTITION FURRING—To increase the thickness of partitions to accommodate pipes, ducts, etc., furr the main partition with half studs or standard 2-5/16″ narrow studs secured to narrow plates.

RAFTERS—Rafters shall consist of stud or joist members, depending on the span and loads supported. The heel of each rafter shall be secured at the wall to the wall plate, with an adjustable rafter hinge screwed to both rafter and plate. Rafters shall be secured to the ridge by cutting away adjacent lower flanges and bolting together through webs of rafters. Jack rafters shall be secured at heels as specified for main rafters and at hip and valley rafters with hip and valley collars and rafter plates.

COLLAR TIES—Shall be provided to brace and tie rafters together where required. They shall consist of stud or plate members secured to the rafter by means of collar tie brackets or hip and valley collars.

ANCHOR BOLTS—Sills for exterior wall studding on masonry walls shall be secured to masonry with ½″-diameter hook bolts spaced approximately 4′ on centers; anchor bolts to be furnished and built in by the masonry contractor.



View of an apartment group at the Ford Foundation. Stran-Steel was chosen for wide use in this project.

STRAN-STEEL JOISTS

SAFE UNIFORMLY DISTRIBUTED LOADS

Table I gives the total safe uniformly distributed load-carrying capacity of Stran-Steel joists for various span lengths and joist spacings. These loads are determined on the basis of the flexural or shear strength of the joist, determined in accordance with the tentative Specifications of the American Iron and Steel Institute (March 1945). The loads given in Table I will not produce deflection greater than 1/360 of the span, and apply in all cases when web stiffeners are used over the supports. When web stiffeners are not used, the total load must be limited to the value shown in Table II, as determined by the length of bearing on the support.

Table II gives limiting values of total uniformly distributed loads on Stran-Steel joists when used without web stiffeners over the supports, based upon safe end reaction values. Bearing lengths in all cases should be limited to a minimum of 2 inches and a maximum of 4 inches. Note that in no case may the total load exceed the value shown in Table I (or Table III for certain joists when a greater deflection than 1/360 of the span is permissible).

Table III gives the total load-carrying capacity of those joists (marked by an asterisk) in Table I whose load-carrying capacity is limited because of deflection. The values given in this table will produce the maximum allowable unit stress in flexure or shear, but will induce deflections greater than 1/360 of the span. Deflections induced by these loads may be computed from the formula:

$$D = \frac{L}{360}\left(\frac{W_1}{W_2}\right)$$

D = deflection in inches.

L = span in inches.

W_1 = tabular value of total load from Table III.

W_2 = tabular value of total load from Table I.

All load figures given in Tables I, II and III are based on the use of 37000# yield strength of steel and a maximum design stress not to exceed 19870# per sq. in. in tension for 16-ga. joists, and 20000# per sq. in for all others.

TABLE I

Based upon either flexural or shear strength of the joist and deflection not to exceed 1/360 of the span. Load capacity of joists marked * is determined by deflection. Load capacity of joists marked ** is determined by web shear.

Span (Feet)	Size of Joist					Floor Load per Sq. Ft. for Various Spacings of Joists					
	Depth	Nom. Gauge No.	Metal Thickness	Weight per Foot	Total Load (pounds)	12″	16″	18″	20″	24″	32″
6	6	16	.0625	2.696	2891	482	361	321	289	241	181
	8**	16	.0625	3.121	3906	651	488	434	391	325	244
	6	14	.0781	3.339	3596	599	449	400	359	300	225
	8	14	.0781	3.870	5656	943	707	629	566	472	354
	8	12	.1094	5.327	7778	1296	972	864	778	648	486
7	6	16	.0625	2.696	2478	354	266	236	212	177	133
	6	14	.0781	3.339	3083	440	330	293	264	220	165
	8	16	.0625	3.121	3890	556	417	371	334	278	208
	8	14	.0781	3.870	4848	693	520	462	416	347	260
	8	12	.1094	5.327	6667	952	714	635	571	476	357
8	6	16	.0625	2.696	2168	271	203	181	163	136	102
	6	14	.0781	3.339	2697	337	253	225	202	169	126
	9**	16	.0625	3.333	3472	434	325	289	260	217	163
	8	16	.0625	3.121	3403	425	319	283	255	212	159
	8	14	.0781	3.870	4242	530	398	354	318	265	199
	9	14	.0781	4.135	5045	631	473	421	379	316	237
	8	12	.1094	5.327	5833	729	547	486	437	365	273
	9	12	.1094	5.878	6980	873	655	582	524	437	327
9	6	16	.0625	2.696	1927	214	161	143	128	107	80
	6	14	.0781	3.339	2397	266	200	177	160	133	100
	8	16	.0625	3.121	3024	336	252	224	202	168	126
	9**	16	.0625	3.333	3472	386	290	257	232	193	145
	8	14	.0781	3.870	3770	419	314	279	251	210	157
	9	14	.0781	4.135	4484	498	374	332	299	249	187
	8	12	.1094	5.327	5185	576	432	384	346	288	216
	9	12	.1094	5.878	6204	689	517	460	413	345	258
10	6*	16	.0625	2.696	1717	172	129	115	103	86	64
	6*	14	.0781	3.339	2122	212	159	141	127	106	80
	8	16	.0625	3.121	2722	272	204	181	163	136	102
	9	16	.0625	3.333	3236	324	243	216	194	162	122
	8	14	.0781	3.870	3393	339	254	226	203	170	127
	9	14	.0781	4.135	4036	404	303	269	242	202	152
	8	12	.1094	5.327	4667	467	350	311	280	233	175
	9	12	.1094	5.878	5584	558	419	372	335	279	209
11	6*	16	.0625	2.696	1419	129	97	86	77	65	48
	6*	14	.0781	3.339	1754	159	119	106	95	80	60
	8	16	.0625	3.121	2474	225	169	150	135	112	84
	9	16	.0625	3.333	2942	267	200	178	160	134	100
	8	14	.0781	3.870	3085	280	210	187	168	140	105
	9	14	.0781	4.135	3669	334	251	223	200	167	125
	8	12	.1094	5.327	4242	386	290	257	232	193	145
	9	12	.1094	5.878	5076	461	346	307	277	231	173
12	6*	16	.0625	2.696	1192	99	74	66	59	50	37
	6*	14	.0781	3.339	1473	123	92	82	74	62	46
	8	16	.0625	3.121	2268	189	142	126	113	94	71
	9	16	.0625	3.333	2696	225	169	150	135	112	84
	8	14	.0781	3.870	2828	236	177	157	142	118	89
	9	14	.0781	4.135	3363	280	210	187	168	140	105
	8	12	.1094	5.327	3889	324	243	216	194	162	122
	9	12	.1094	5.878	4653	388	291	259	233	194	146
13	8	16	.0625	3.121	2093	161	121	107	97	80	60
	9	16	.0625	3.333	2489	191	143	127	115	95	72
	8	14	.0781	3.870	2610	201	151	134	121	101	75
	9	14	.0781	4.135	3105	239	179	159	143	120	90
	8	12	.1094	5.327	3590	276	207	184	166	138	104
	9	12	.1094	5.878	4295	330	248	220	198	165	124
14	8*	16	.0625	3.121	1833	131	98	87	79	65	49
	9	16	.0625	3.333	2311	165	124	110	99	82	62
	8*	14	.0781	3.870	2269	162	122	108	97	81	61
	9	14	.0781	4.135	2883	206	155	137	124	103	77
	8	12	.1094	5.327	3333	238	179	159	143	119	89
	9	12	.1094	5.878	3989	285	214	190	171	143	107
15	8*	16	.0625	3.121	1596	106	80	71	64	53	40
	8*	14	.0781	3.870	1977	132	99	88	79	66	50
	9*	16	.0625	3.333	2135	142	106	95	85	71	53
	9*	14	.0781	4.135	2646	176	132	117	106	88	66
	8*	12	.1094	5.327	2719	181	136	121	109	91	68
	9*	12	.1094	5.878	3660	244	183	163	146	122	92
16	8*	16	.0625	3.121	1403	88	66	59	53	44	33
	8*	14	.0781	3.870	1738	109	82	73	65	55	41
	9*	16	.0625	3.333	1877	117	88	78	70	59	44
	9*	14	.0781	4.135	2325	145	109	97	87	73	54
	8*	12	.1094	5.327	2390	149	112	99	89	75	56
	9*	12	.1094	5.878	3217	201	151	134	121	101	75
17	9*	16	.0625	3.333	1662	98	74	65	59	49	37
	9*	14	.0781	4.135	2060	121	91	81	73	61	45
	9*	12	.1094	5.878	2850	168	126	112	101	84	63
18	9*	16	.0625	3.333	1483	82	62	55	49	41	31
	9*	14	.0781	4.135	1837	102	77	68	61	51	38
	9*	12	.1094	5.878	2542	141	106	94	85	71	53
19	9*	16	.0625	3.333	1331	70	53	47	42	35	26
	9*	14	.0781	4.135	1649	87	65	58	52	44	33
	9*	12	.1094	5.878	2281	120	90	80	72	60	45
20	9*	16	.0625	3.333	1201	60	45	40	36	30	23
	9*	14	.0781	4.135	1488	74	56	49	44	37	28
	9*	12	.1094	5.878	2059	103	77	69	62	52	39

TABLE II

Values of total load based on safe value of reaction. Values given for various bearing lengths without web stiffeners are based on University of Michigan tests of Stran-Steel joists. Values for joists with web stiffeners are determined on the basis of web shear in accordance with the 1946 A. I. S. I. specifications for the design of light-gauge steel structural members and are limiting values which in no case may be exceeded.

Depth of Joist	Gauge	For Joists with Web Stiffeners	For Joists without Web Stiffeners Length of Bearing in Inches					
			1	2	3	4	5	6
6	16	5208	1952	2214	2474	2734	2996	3254
	14	10170	3050	3458	3864	4270	4676	5084
8	16	3906	1466	1660	1856	2052	2248	2442
	14	7628	2288	2592	2896	3202	3508	3812
	12	20964	4464	5036	5610	6184	6756	7330
9	16	3472	1302	1476	1648	1822	1996	2170
	14	6780	2034	2304	2576	2846	3118	3390
	12	18607	3968	4478	4988	5498	6008	6516

TABLE III

Limiting values of total load for joists in Table I whose capacity was limited by deflection, based upon flexural or shear strength. These loads will produce deflection greater than 1/360 of the span, but will not induce flexural stress in excess of 19870# per sq. in. on 16-ga. joists, or 20000 on 14- & 12-ga. joists.

Span (Feet)	Size of Joist					Floor Load per Sq. Ft. for Various Spacings of Joists					
	Depth	Nom. Gauge No.	Metal Thickness	Weight per Foot	Total Load (pounds)	12″	16″	18″	20″	24″	32″
10	6	16	.0625	2.696	1734	173	130	115	104	86	65
	6	14	.0781	3.339	2157	216	162	144	130	108	81
11	6	16	.0625	2.696	1576	143	107	95	86	72	54
	6	14	.0781	3.339	1961	178	134	119	107	89	67
12	6	16	.0625	2.696	1444	120	90	80	72	60	45
	6	14	.0781	3.339	1797	150	113	100	90	75	56
14	8	16	.0625	3.121	1944	139	104	93	83	69	52
	8	14	.0781	3.870	2424	173	130	115	104	87	65
15	8	16	.0625	3.121	1816	121	91	81	73	60	45
	9	16	.0625	3.333	2159	144	108	94	84	70	53
	8	14	.0781	3.870	2262	151	113	101	91	76	57
	9	14	.0781	4.135	2691	179	134	119	107	90	67
	8	12	.1094	5.327	3111	207	155	138	124	104	78
	9	12	.1094	5.878	3723	248	186	165	149	124	93
16	8	16	.0625	3.121	1701	106	80	71	64	53	40
	9	16	.0625	3.333	2023	126	94	84	76	63	47
	8	14	.0781	3.870	2121	133	100	89	80	67	50
	9	14	.0781	4.135	2523	158	119	105	95	79	59
	8	12	.1094	5.327	2917	182	137	121	109	91	68
	9	12	.1094	5.878	3490	218	164	145	131	109	82
17	9	16	.0625	3.333	1903	112	84	75	67	56	42
	9	14	.0781	4.135	2374	140	105	93	84	70	53
	9	12	.1094	5.878	3285	193	145	129	116	97	72
18	9	16	.0625	3.333	1799	100	75	67	60	50	38
	9	14	.0781	4.135	2242	125	94	83	75	63	47
	9	12	.1094	5.878	3102	172	129	115	103	86	65
19	9	16	.0625	3.333	1702	90	68	60	54	45	34
	9	14	.0781	4.135	2124	112	84	75	67	56	42
	9	12	.1094	5.878	2939	155	116	103	93	78	58
20	9	16	.0625	3.333	1618	81	61	54	49	40	30
	9	14	.0781	4.135	2018	101	76	67	61	51	38
	9	12	.1094	5.878	2792	140	105	93	84	70	53

TABLE OF GENERAL PROPERTIES

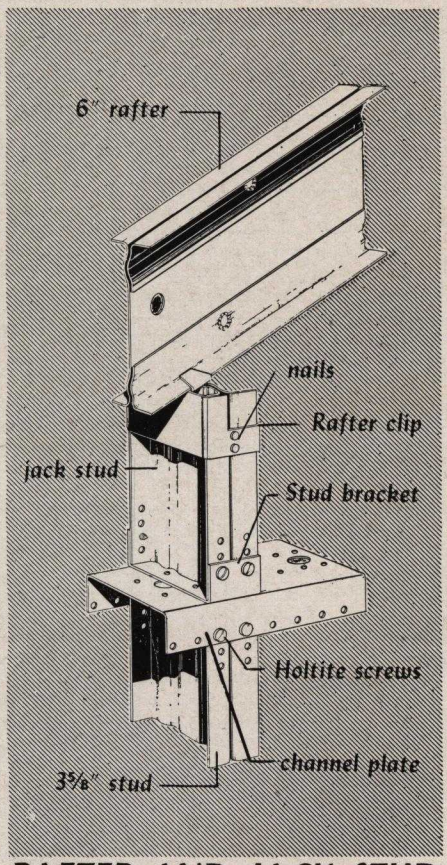
Properties / Member	Over-all Dimens.	Nom. Gauge No.	Metal Thickness	Area of Section	Weight per Foot	ABOUT MAJOR AXIS				ABOUT MINOR AXIS			
						I	S	r	x	I	S	r	x
6″ Joist	2x6	14	0.0781	0.982	3.339	4.855	1.618	2.225		0.1147	0.1122	0.338	
	2x6	16	0.0625	0.7930	2.696	3.928	1.309	2.228		0.0916	0.0895	0.336	
8″ Joist	2x8	12	0.1094	1.573	5.327	14.0	3.50	2.970		0.163	0.160	0.320	
	2x8	14	0.0781	1.140	3.870	10.178	2.545	2.984		0.113	0.112	0.315	
	2x8	16	0.0625	0.918	3.121	8.219	2.055	2.992		0.090	0.089	0.313	
9″ Joist	2x9	12	0.1094	1.729	5.878	18.845	4.188	3.301		0.162	0.152	0.306	
	2x9	14	0.0781	1.218	4.135	13.620	3.027	3.341		0.118	0.117	0.308	
	2x9	16	0.0625	0.981	3.333	10.992	2.443	3.348		0.930	0.093	0.306	
3⅝″ Stud	2x3⅝	16	0.0625	0.660	2.244	1.163	0.641	1.327		0.090	0.086	0.368	
2⅝″ Stud	2x2⅝	16	0.0625	0.500	1.700	0.393	0.340	0.886		0.090	0.085	0.423	
Half Stud	2x1 11/16	16	0.0625	0.313	1.062	0.098	0.089	0.561	0.589	0.045	0.043	0.378	
Std. Channel Plate	3 13/16x1⅝	16	0.0625	0.429	1.461	0.842	0.442	1.504		0.080	0.063	0.465	0.343
Narrow Channel Plate	2½x1⅝	16	0.0625	0.347	1.182	0.309	0.247	1.030		0.070	0.059	0.491	0.431

STRAN-STEEL PACKAGED FRAMING

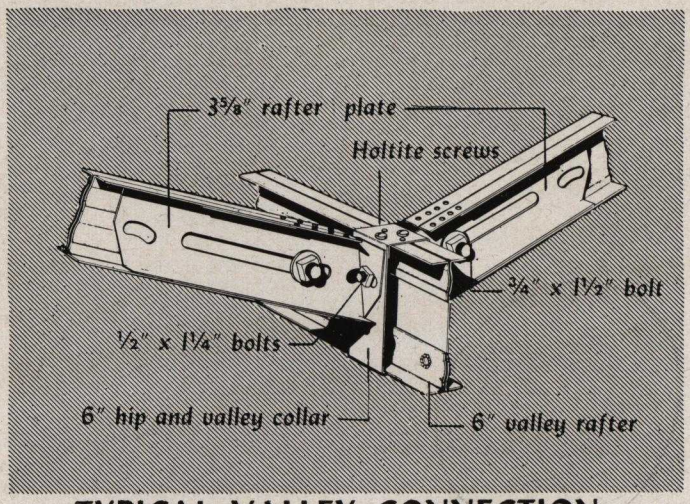
Stran-Steel Packaged Framing, by utilizing a *minimum* of standardized pieces, achieves still greater erection speed and shortens the builder's investment period. Yet it allows complete freedom from the architectural monotony associated with "pre-fab" houses.

See Page 22

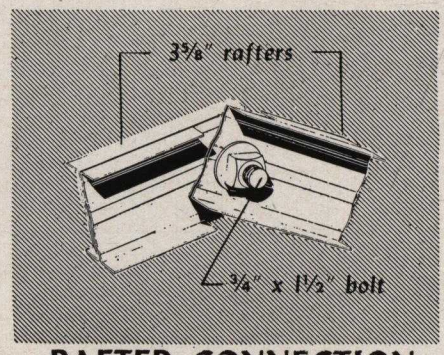
Construction Details



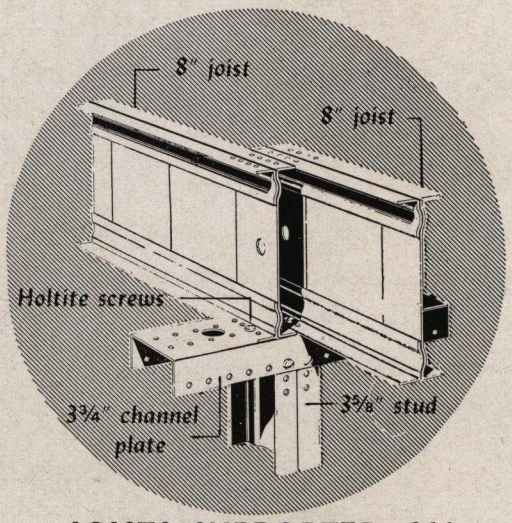
RAFTER AND JACK STUD CONNECTION



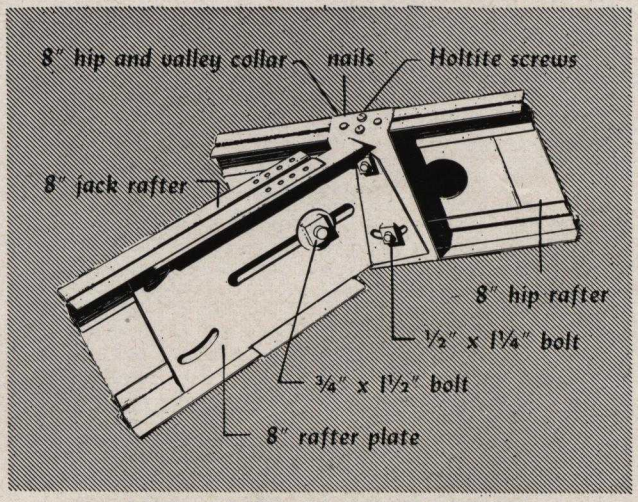
TYPICAL VALLEY CONNECTION



RAFTER CONNECTION AT PEAK

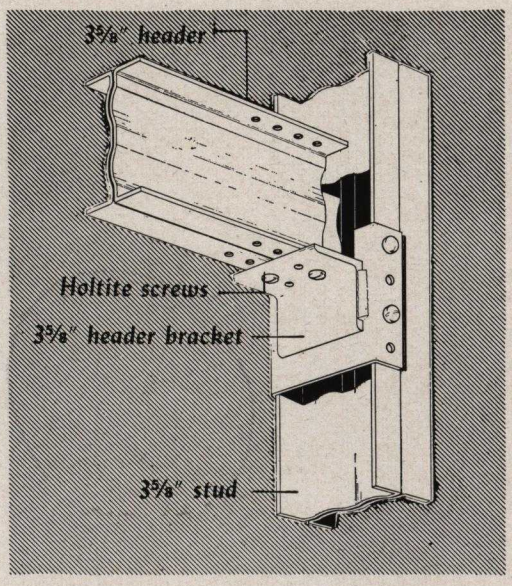


JOISTS SUPPORTED ON BEARING PARTITION

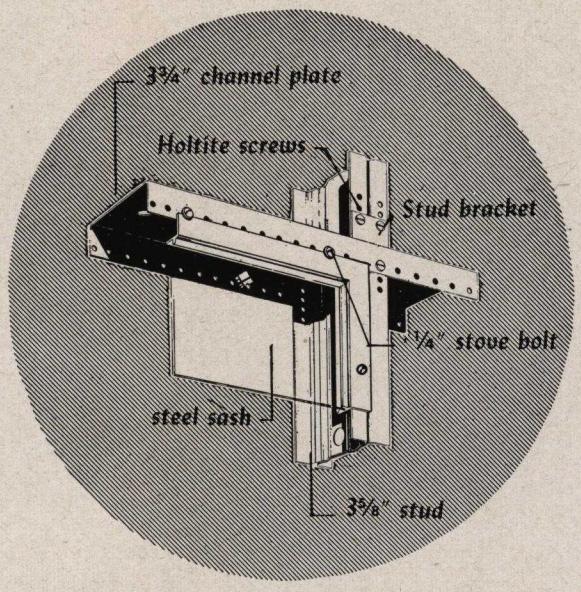


HIP AND JACK RAFTER CONNECTION

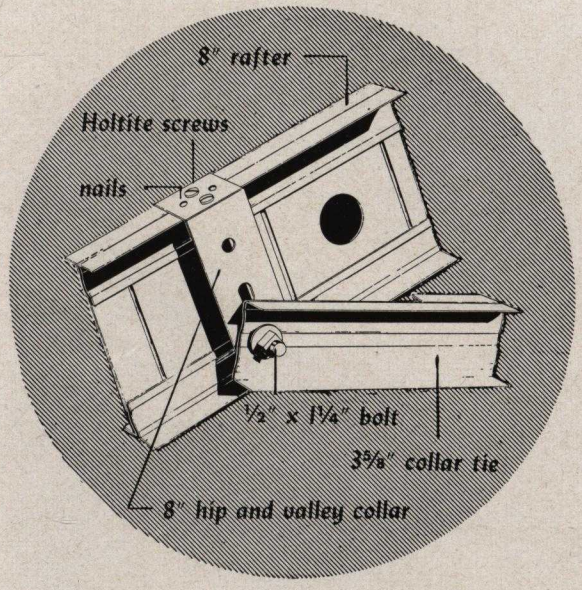
Construction Details



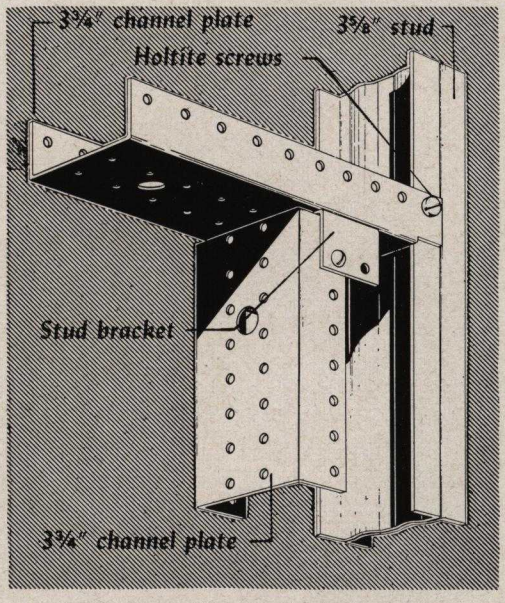
TYPICAL STUD AND HEADER CONNECTION



FRAMING AT SASH OPENING (HEAD AND JAMB)

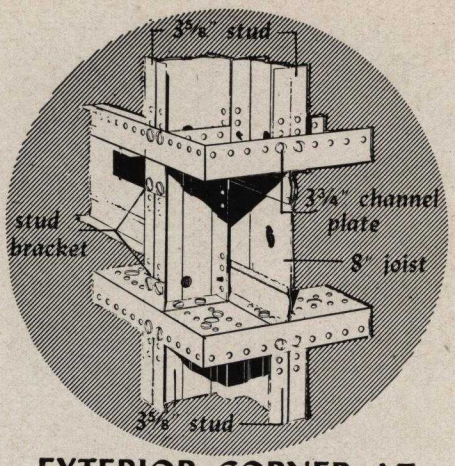


TYPICAL COLLAR TIE CONNECTION

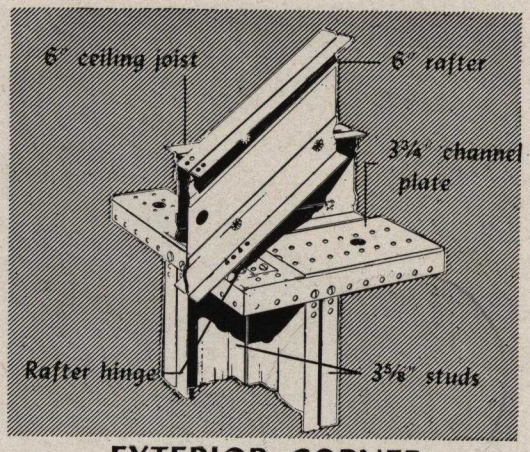


FRAMING AT DOOR OPENING (HEAD AND JAMB)

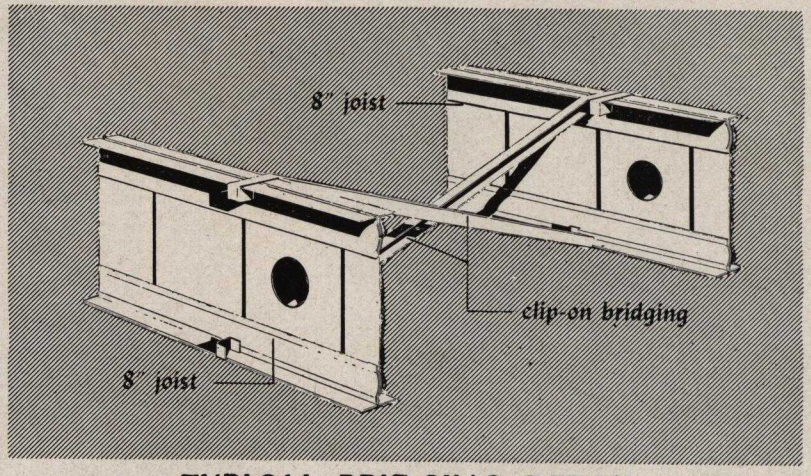
Construction Details



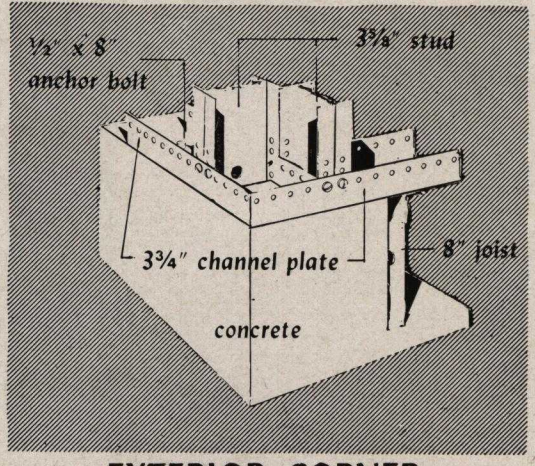
EXTERIOR CORNER AT SECOND FLOOR



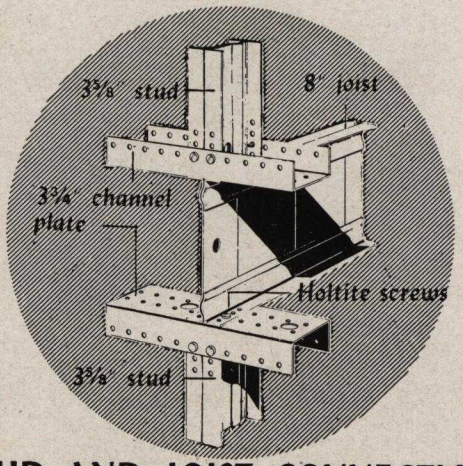
EXTERIOR CORNER AT ROOF LINE



TYPICAL BRIDGING DETAIL

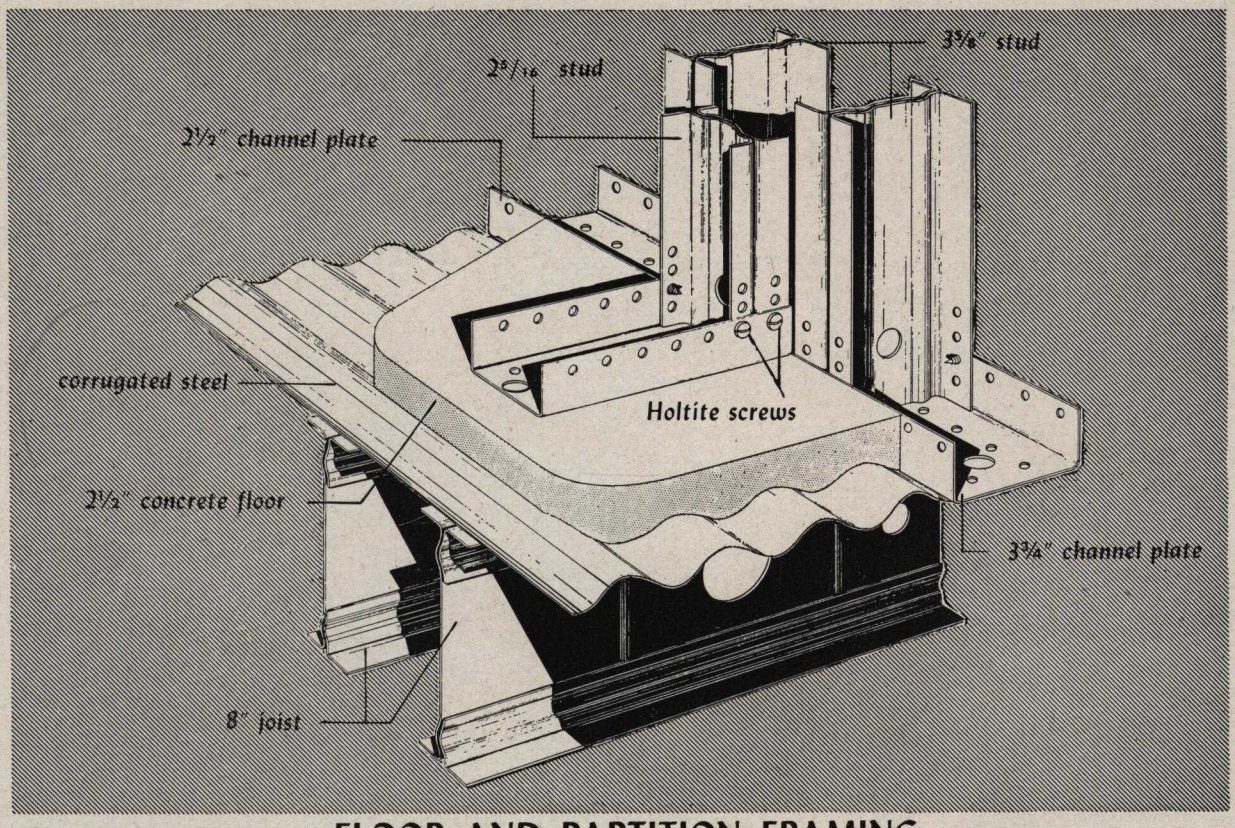


EXTERIOR CORNER AT FIRST FLOOR

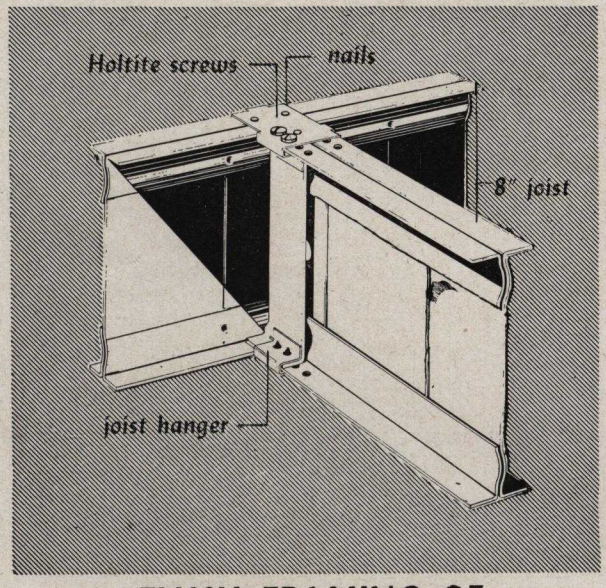


STUD AND JOIST CONNECTION SECOND FLOOR FRAMING

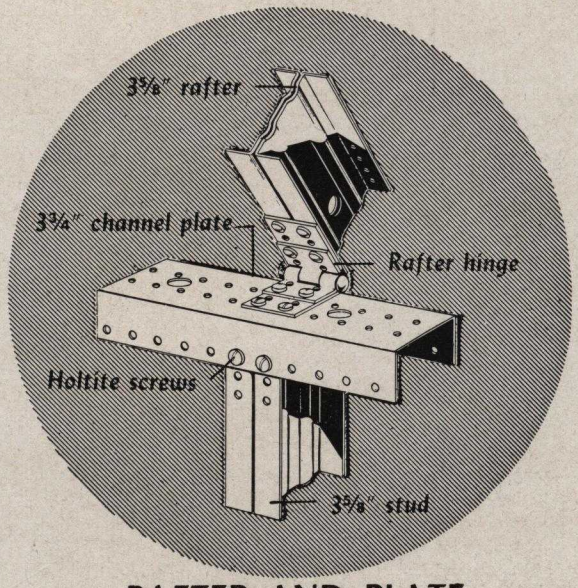
Construction Details



FLOOR AND PARTITION FRAMING

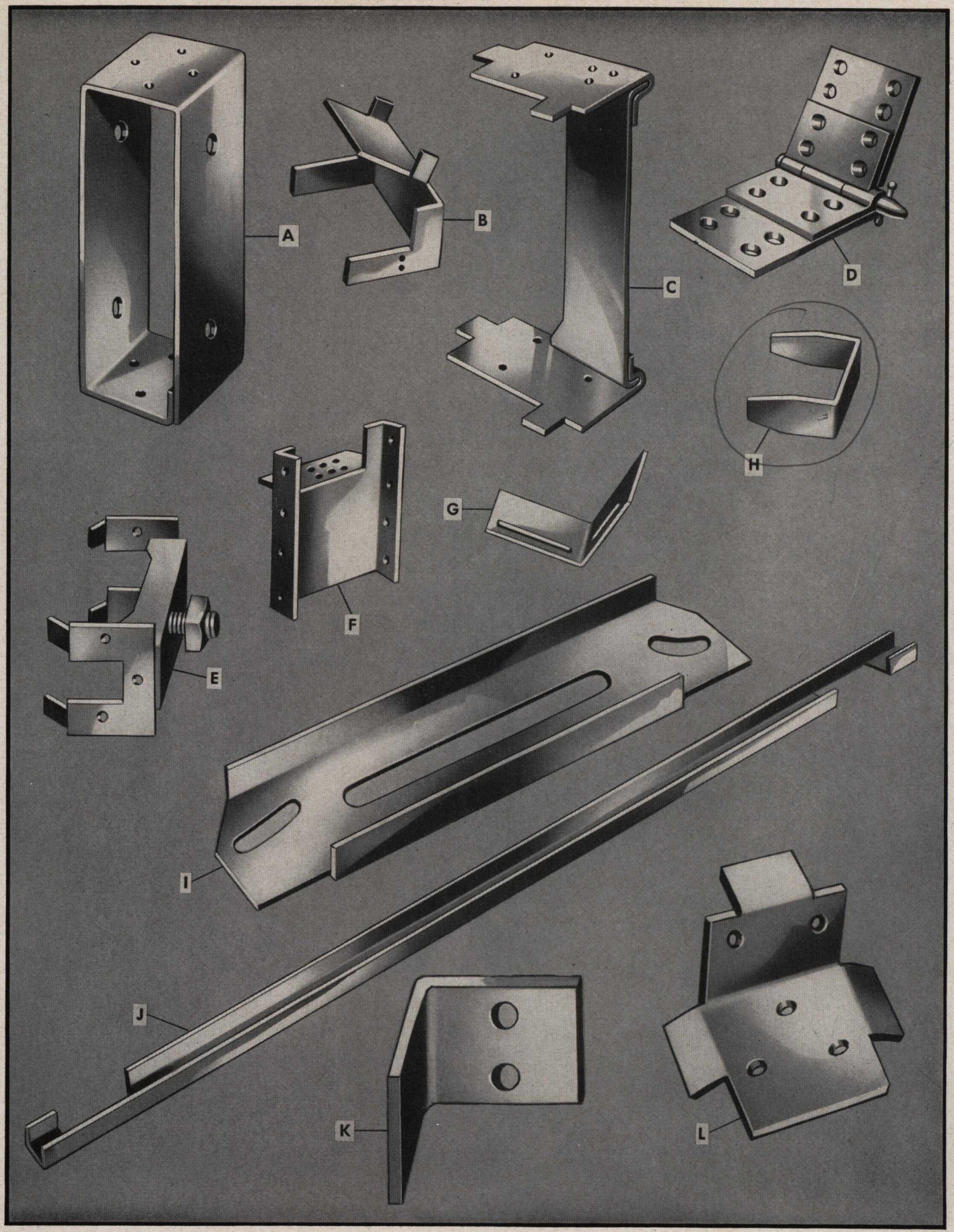


FLUSH FRAMING OF FLOOR JOISTS



RAFTER AND PLATE CONNECTION

Accessories



Accessories

One of the features which have had much to do with the rapid acceptance of Stran-Steel is the simplicity of the attachments. The illustrations on the opposite page and the descriptions below show the striking degree to which all attachments have been simplified. They are designed to inter-connect all Stran-Steel members with metal attaching screws, or bolts; several are also punched for nailing to main members for additional security.

A—HIP AND VALLEY COLLAR, 3 SIZES—This attachment is used to connect 8″, 6″ and 3⅝″ members where used as hips, valleys and rafters.

B—RAFTER CLIP—Connects gable studs to rafters and jamb studs to headers.

C—JOIST HANGER—Used with 6″, 8″, 9″ joists of all gauges. Attaches rapidly and securely with screws and nails.

D—RAFTER HINGE—Loose butt hinge with cotter key through hinge pin. Connects lower ends of rafters to plate.

E—COLLAR TIE BRACKET—Used for attaching 3⅝″ members (used as collar ties) to rafters.

F—HEADER BRACKET, 2 SIZES—For supporting joist headers over opening (1) to adjacent 3⅝″ standard studs, and (2) to adjacent narrow studs.

G—CORNER BRACKET—Used at top and bottom of stud and plate corner; also bent to reinforce all corners other than 90°, such as bays, etc.

H—C-CLIP—This attachment is driven into nailing grooves of adjacent parallel members as a tie. Usually spaced 18″ to 3′ apart.

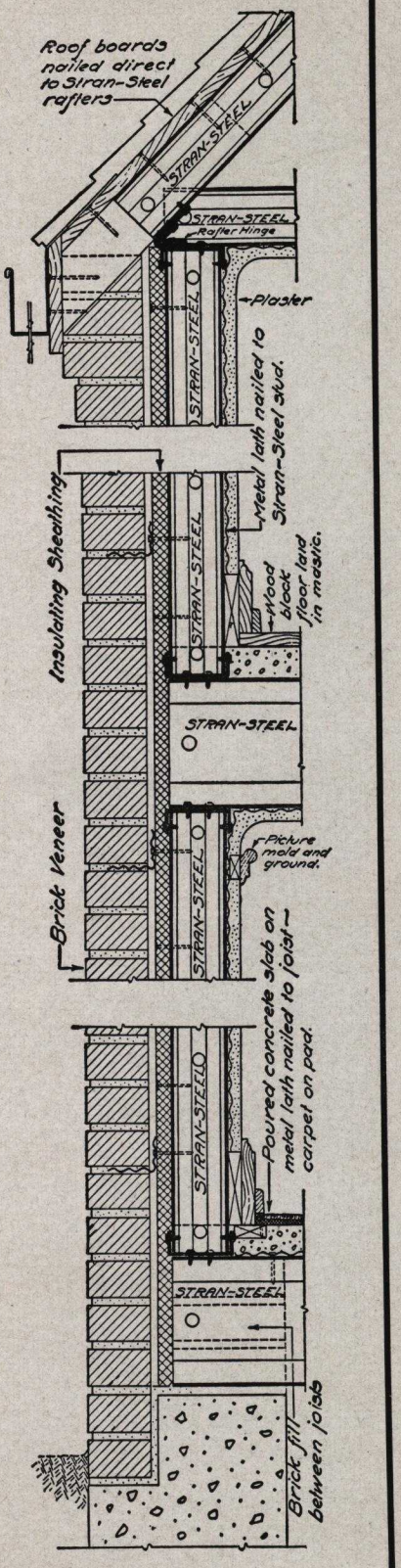
I—RAFTER PLATE, 3 SIZES—Used for top connection of hip rafters and bottom connection of valley rafters.

J—BRIDGING—This attachment is used in pairs between joists. Ends are coped out to engage joist flanges.

K—ANGLE BRACKET—Connects rafter support from ceiling joist to under side of rafter; bent to fit pitch of rafter.

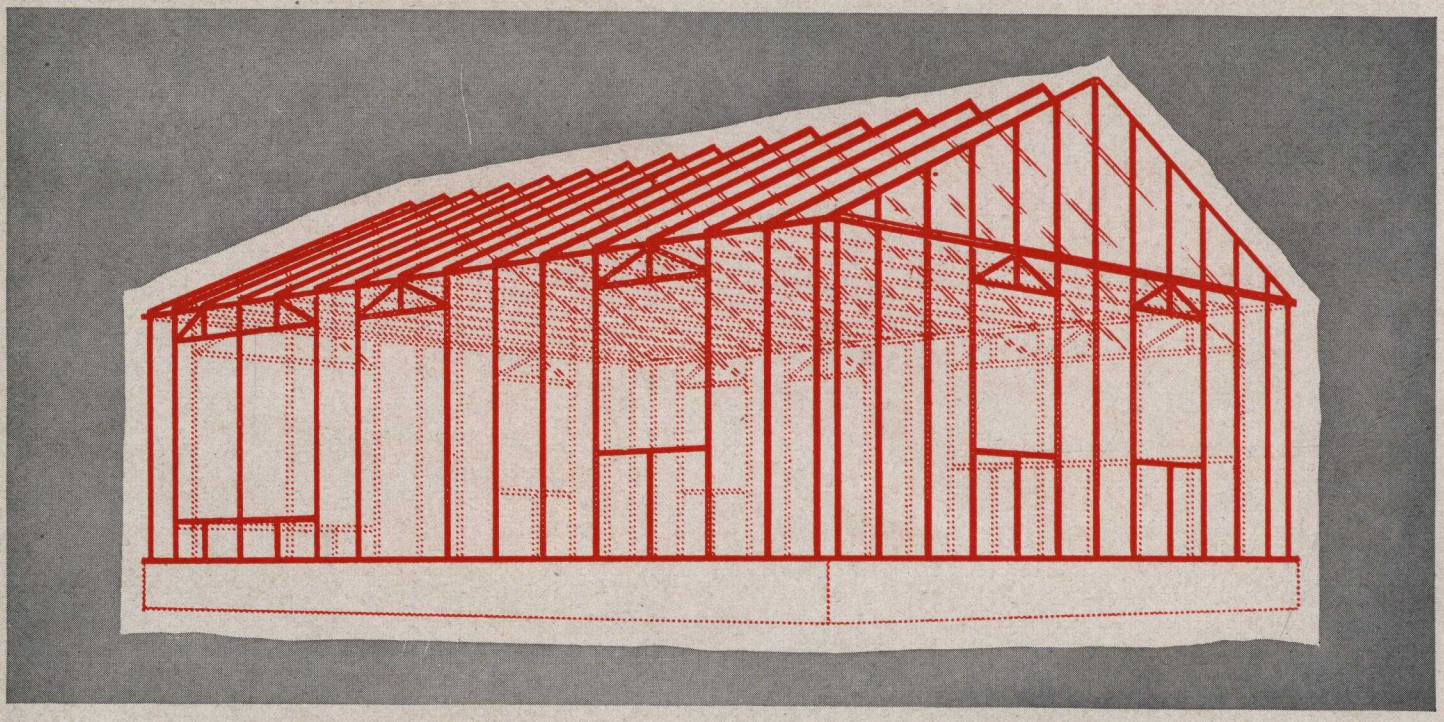
L—COMBINATION CLIP—This attachment connects stair carriage to adjacent studs; also used for tying half stud lath backing to adjacent studs.

TYPICAL STRAN-STEEL WALL SECTION



Stran-Steel Packaged Framing

Stran-Steel Packaged Framing represents a fast, simplified, economical way to build with Stran-Steel. It consists of a fixed number of parts and pieces, sub-assembled and assembled into panels for speedy erection on the site. End wall dimension is fixed at 24', and roof slope at 5—12. Length, placement of window and door openings in wall panels, and collateral materials, are variables which provide wide scope in design.



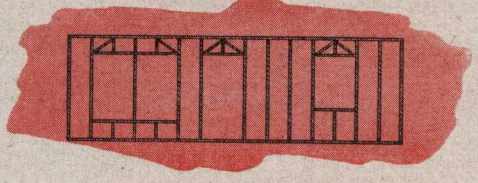
ASSEMBLY METHODS *SAVE TIME . . . SAVE MONEY*

Stran-Steel Packaged Framing makes it possible for builders to increase turnover and reduce investment time through faster erection. In cases where the Stran-Steel dealer does the final assembly on the site, erection time is completely eliminated from the builder's considerations. Here is the way Stran-Steel Packaged Framing is delivered by the dealer for final assembly:

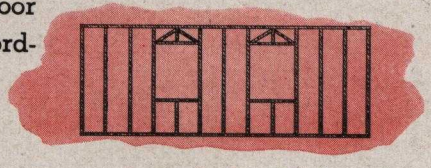
1. LOOSE PARTS—Floor joists and bridging as required for length of house. 13 joists for 28' length, one additional for each 2' addition in length.

2. TAIL JOIST PANELS—Two for each house.

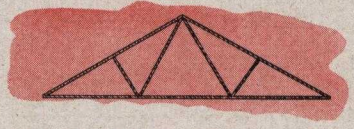
3. SIDE WALLS—Four side wall panels, two for each side. Window and door panels placed according to design.



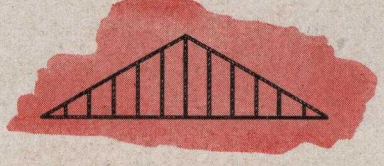
4. END WALLS—Two end wall panels complete, with window and door panels placed according to design.



5. TRUSSES—13 clear-span trusses for 28' length, one additional truss for every 2' addition.



6. END WALL GABLE PANELS—Two for each house.



Stran-Steel Packaged Framing

. . . a sturdy, economical framing system that gives free scope to architects and builders.

Stran-Steel Packaged Framing makes available the advantages of Stran-Steel construction at very low cost. At the same time, it permits distinction in design through variations in length, in window and door openings, and in the use of collateral materials. The listing of collateral materials and combinations that can be used with Stran-Steel suggests the many possibilities in exterior appearance, and indicates the possibilities of eliminating highly critical materials.

COLLATERAL MATERIALS

FOUNDATIONS— 1. Masonry block. 2. Concrete continuous footing. 3. Pier and grade beam. 4. Concrete slab. 5. Items 1 and 2 with basement.

FLOORS— 1. Wood and wood sub-floor on joists. 2. Wood and concrete sub-floor on joists. 3. Asphalt tile or linoleum on concrete or wood sub-floor over joists. 4. Items 2 and 3 on concrete slab.

EXTERIOR WALLS— 1. Conventional sheathing and wood or asbestos siding. 2. Conventional sheathing and brick or stone veneer. 3. Conventional sheathing and gunite or stucco over lath or wire netting. 4. Furring and plywood. 5. Conventional sheathing and wood or asbestos shingles.

INTERIOR WALLS AND CEILINGS— 1. Plaster on all types of lath. 2. Gyp-board and wallpaper. 3. Dry-wall —plywood.

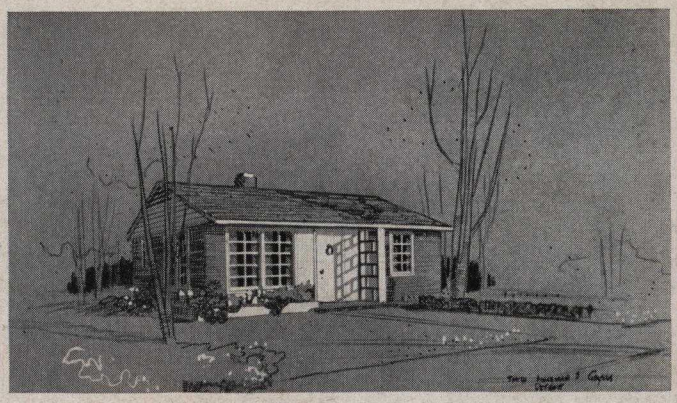
INTERIOR PARTITIONS— Partitions are non-bearing, and may be any conventional type, such as solid plaster, non-bearing stud and plaster, dry-wall, gyp-block or other.

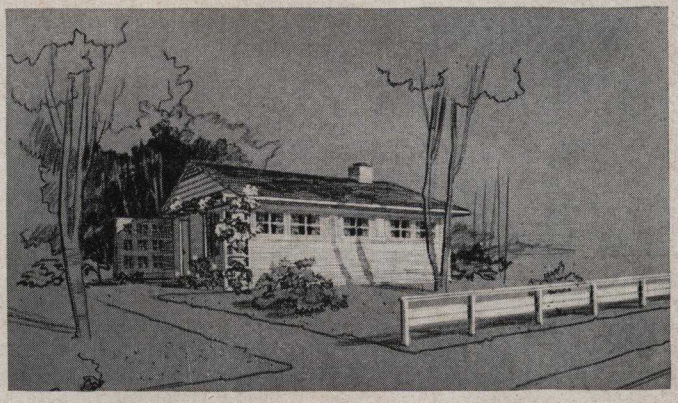
WINDOWS, DOORS AND MILLWORK— All conventional with one exception—D. H. windows with weights as counterbalances can be used only on jobs where brick or stone veneer is used. All other wall sections using D.H. windows must use spring-type balances.

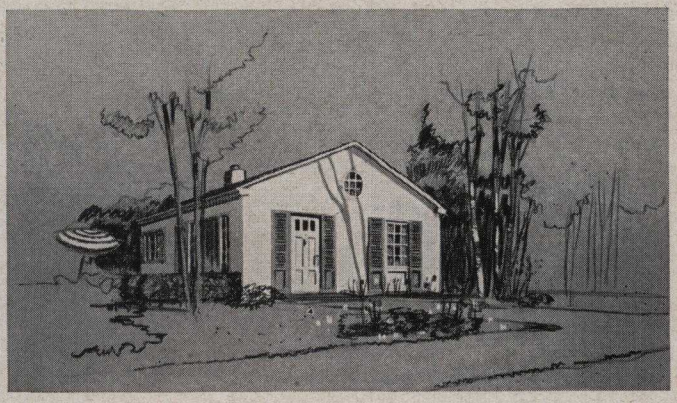
CORNICES— Cornices on the eave side are variable, inasmuch as they can be: (a) close, with only a facia board and gutter, (b) an overhang with closed-in soffit, (c) an overhang with exposed out-lookers on the under side. Many other variations are possible.

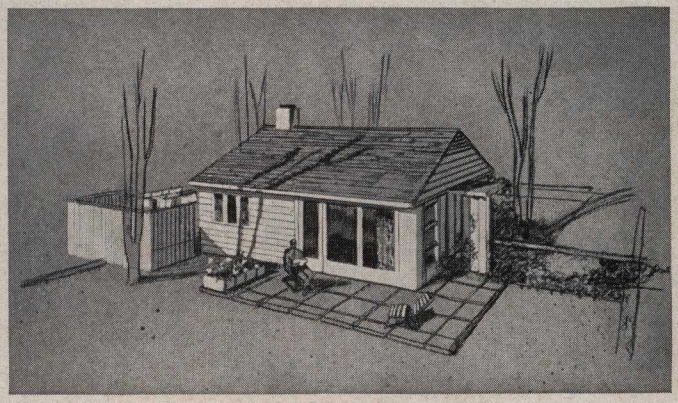
ROOFS— The roof slope is fixed at 5—12. This allows the use of all conventional roofing, such as: 1. Shingle (all types). 2. Metal (all types). 3. Built-up. 4. Slate.

OTHER ITEMS— Attic ventilation, insulation of walls and roof, electrical work, plumbing and heating are all accomplished by conventional equipment and methods.









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